IN THE CLAIMS

1. A process for producing an impermeable or substantially impermeable electrode suitable for use in an electrolytic capacitor or battery, which comprises immersing a substrate in a suspension comprising graphite in an organic solvent in a concentration of graphite of 1 to 50 g/l to deposit a layer of graphite on the substrate, removing the substrate with graphite layer thereon from the suspension, drying the substrate with graphite layer thereon at approximately 80 to 150°C, and heat-treating the dried substrate with graphite layer thereon at 200 to 450°C to form an impermeable or substantially impermeable conductive layer of graphite on the substrate.

2. The process according to claim 1, wherein the substrate is immersed in the suspension for approximately 10 to 60 seconds.

3. The process according to claim 1, wherein the drying is for approximately 1 minute.

4. The process according to claim 1, wherein the heat-treating is for approximately 5 to 60 minutes.

5. The process according to claim 1, wherein the substrate is a metal foil, or an insulating foil comprising a synthetic material.

6. The process according to claim 5, wherein the metal foil is an aluminum foil.

7. The process according to claim 5, wherein the metal foil, before immersion in the suspension, is untreated, chemically treated, electrochemically pickled, or subjected to mechanical surface treatment.

8. The process according to claim 7, wherein the mechanical surface treatment is brushing.

9. The process according to claim 1, wherein a layer of the graphite is deposited on one side of the substrate.

10. The process according to claim 1, wherein a layer of the graphite is deposited on both sides of the substrate.

11. The process according to claim 1, wherein the organic solvent is an alcohol, a mixture of alcohols, or a carbonyl group-containing organic solvent.

12. The process according to claim 1, wherein the heat-treating is conducted in a controlled atmosphere or an inert gas atmosphere.

13. The process according to claim 12, wherein the inert gas atmosphere is a nitrogen or argon atmosphere.

14. The process according to claim 1, wherein the substrate has a thickness of approximately 15 to 55 μm.

15. An impermeable or substantially impermeable electrode suitable for use in an electrolytic capacitor or battery, which comprises a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate.

16. An electrolytic capacitor comprising, as a cathode, a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate, and an anode which has an oxide layer with dielectric properties.

17. The capacitor according to claim 16, which is a supercapacitor which operates according to a principle of a Helmotz double layer and a diffusion layer.

18. A battery comprising, as a negative electrode, a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate.

19. The battery according to claim 18, which is a graphite battery having a graphite block and a negative battery case, and wherein the substrate is a metal foil, both sides of the metal foil are covered with a layer of the graphite, and contact is established between the graphite block and the negative case.

20. The battery according to claim 18, which is a lithium battery having separators and a negative battery case, and wherein the substrate is a metal foil placed between the separators and connected with the negative battery case.

21. Process of manufacturing an impermeable electrode for electrolytic capacitors, supercapacitors and batteries, providing an impermeable conductive graphite layer on a substrate, deposited from a suspension of graphite having a concentration of the graphite in its solvent between 1 and 50 g/1, by immersing the substrate into the suspension for a predetermined time of e.g. approximately 10 to 60 seconds, the deposition of the graphite layer being followed by drying the substrate with the deposited layer at a temperature between 80 and 150°C for a predetermined time of e.g. approximately 1 minute and being followed by thermal treatment at a temperature between 200 and 450°C for a predetermined time of e.g. approximately 5 to 60 minutes.

22. Process according to claim 21, wherein a metal foil, e.g. aluminum foil, or an isolating foil is used as a substrate.

23. Process according to claim 22, wherein the metal foil before the deposition of the graphite layer is kept raw or surfaced pickled, carried out chemically or electro-chemically, and/or mechanically surfaced treated, e.g. by brushing.

24. Process according to claim 21, wherein the graphite layer is deposited on one side or on both sides of the substrate.

25. Process according to claim 21, wherein alcohol, a mixture of alcohols or a solvent comprising substances with carbonylic groups is/are used as organic solvent for the graphite.

26. Process according to claim 21, wherein the thermal treatment of the graphite layer is performed in a controlled atmosphere or an inert gas atmosphere, as nitrogen or argon.

27. Process according to claim 21, wherein a substrate is used having a thickness of about 15 to 55 μm.

28. Use of an electrode as described in claim 21 as a cathode of an electrolytic capacitor having an anode carrying a layer of an oxide with dielectric characteristics deposited on it, or as an electrode of a supercapacitor working according to the principle of Helmotz double layer and diffusion layer.

29. Use of an electrode as described in claim 21, as a negative electrode in an electric battery.

30. Use according to claim 29, as an electrode in a graphite battery having a graphite block and a negative casing, wherein a metal foil is used as substrate, wherein both faces of the substrate are coated by a graphite layer and wherein electrical contact is insured between the graphite block and the negative casing.

31. Use according to claim 29, as an electrode in a lithium battery, wherein a metal foil is used as a substrate, which is inserted between the separators and connected to the negative battery casing.